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## Staircases as a representative space of architecture

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### Abstract

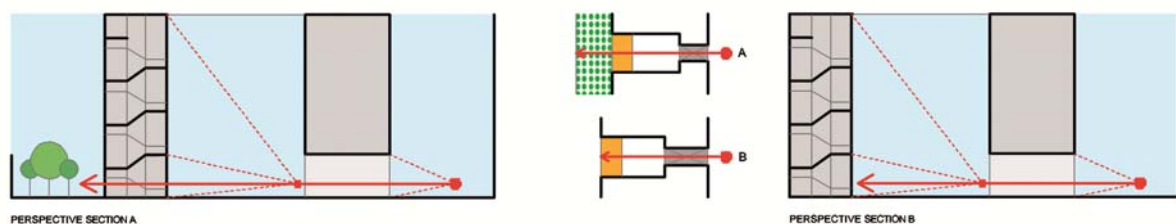
Due to its important architectural function, the staircase of a project is as old as the architecture itself, with there being significant examples throughout history, from those of the Palace of Knossos in Crete and Persepolis in Iran as well as in the works of Francesco di Giorgio Martini, Leonardo da Vinci and Bramante. However, it is in the Baroque period that we experience forms that restore the staircase of a project as a space-time configuration representative of the architecture, along with not only the monumental but also imaginative dimension as demonstrated by some European models introduced by Johann Balthasar Neumann in Germany or Mansart in France. In Italy, however, there is a particular design period of the staircase as a representative area of the architecture in Naples, with the work of Ferdinando Sanfelice being a masterful example. Specifically, the staircases of Ferdinando Sanfelice in Naples will be studied, highlighting the geometric-configuration arrays of his two main models i.e. the "gullwing" and the cantilever, which earned the architect the nickname of "Ferdina lievato sotto" (Ferdinando get out from below). The unusual and bold formal configuration of his staircases, whether they were "neck" structures or, especially, "overhang" or "in flight", had such an echo to the point that their lightweight appearance gave rise to legitimate doubts about their solidity and resistance.

**Keywords:** Neapolitan historic buildings, Ferdinando Sanfelice, staircases, architectural survey.

### 1. The staircases of the historic buildings of Naples

Open eighteenth-century Neapolitan staircases originate from the 1400s and are architectural organisms characterized by peculiar space-perception relations. This complex architectural reality manifests itself through a dynamic journey of flights of steps covered with vaults and a changing perception of views, with light and shadow created by perforated walls. These holed fronts are an added value to design capable of triggering a space-perceptual continuity between the courtyard (interior space), where there is a staircase and the road (external space) from which the staircase takes you through the archway of the entrance. In this sense, while in pursuit of its main architectural function (the vertical connection between the different floors of a building), the open Neapolitan staircase is, at the same time, a reservoir of space representative of several factors which are produced in it and manifest themselves. This condition finds reason in the distress of the roads with the consequent inability to grasp from each road the unique design of each façade. Therefore, in the expressive requalification programme of the residence, the portal and the staircase assume the task of attractor as if a piece of scenery where the portal is the proscenium and the staircase the backdrop. In residential Neapolitan architecture, it is worth noting the widespread existence of an entrance that consists of a portal, entrance hall, courtyard and staircase. The portal draws the attention of the passerby as a attractor element due to its shape, size, material, decoration as well as function (to allow the passage from an internal to an external space) that antiquity has given a symbolic meaning. Functionally, the portal is an opening that allows for the passage from one environment to another. Symbolically, the function hails back to the arc of triumph, monumental building of the Roman period

designed to celebrate a victory, arranged along the streets where the triumphal processions were carried out and under which the leader marched with the spoils of war, treasure and slaves [13]. In historical Neapolitan buildings, the portal is the first link in a continuous spatial sequence marking the transition from a public space (the street) to a private one (the building). Whether it is a noble or lesser building, the portal is a symbolic means of representation that, by virtue of size, shape, material and decorations invades the street attracting the attention of the passerby. In close connection with the road, the plastic-figurative spatiality of the portal and the light-shadow-light pattern (which connotes the sequence street-entrance-courtyard) attract the passerby who, having passed the entrance hall, looks into the intimate space, the courtyard, an open reservoir of space where in most Neapolitan buildings there is the “open staircase”, often located in the front position with regard to access in order to visually seduce the passerby (when passing by on the street ), thanks to the strength of an ever-changing spatial dynamism generated on the performance of the buttresses and a multiplicity of vaulted structures, typologically different and variously articulated. In some cases, behind the staircase, there is the garden, and the set is transformed into a multidimensional perceptual context in which the portal is the intermediary (Fig. 1), with a masterful example being the eighteenth-century “gullwing” staircase in Palazzo Sanfelice by the architect Ferdinando Sanfelice, located in the Sanità neighbourhood in Naples.



**Fig. 1:** The access systems of a residential architecture: portal, entrance hall, courtyard, staircase, garden.

## 2. The Sanfelician “gullwing” model: the extroverted staircase

Among all the open staircases of eighteenth century Naples, without a doubt the most impressive are the work of Ferdinando Sanfelice (or his collaborators), unconventional architect due to both language and structural design. For Sanfelice, the model of the “open staircase” is a bold disseminator capable of reworking the linguistic and structural elements using an ingenious and free invention: the back wall of the courtyard (opposite the road and hiding the body of the staircase) is interpreted as an improvised and piece of scenery to burrow into, with the prime task of manifesting to the outside the complex system of flights of steps. In this sense, Ferdinando San Felice moved away from frivolous and superficial decorations to experiment with bold and unprecedented formal solutions capable of being implanted on unusual planimetric configurations, pillars, arches, vaults and flights of steps with a unparalleled structural fluency. In this unified architectural composition, the real protagonist of the cognitive experience is the visual-perceptual dynamic use of space and light, with the latter being generated by the ever-changing play of solids and voids.

In the 1720's, Sanfelice designed in Via Arena in Sanità his family home, consisting of two buildings assembled on the street with a single façade with two identical portals, straight broken profile with molding and embossed. The staircases, with a different spatial layout, each facing a courtyard with a different shape. In particular, one of the two staircases (number 6), taking up and reinterpreting the tradition of the monumental double staircase, introduces in the panorama of the building an unusual theatrical model called by recent historiography “hawk wing” or “gullwing” [6] (Figs. 2-B, 3-B).

The staircase occupies the entire width of the transverse façade of the courtyard opposite the entrance and is made up by a body that is the same height as the building. The structural system includes sixteen pillars whose planimetric rhythm is regulated by a double bilateral symmetry and in which there are different flights of stairs, landings and wells, and upon which the whole system of vaults and arches rests, including the horizontal flights and rampant. Both sides of this staircase, of considerable size (the one facing the entrance as well as the one facing the back), are completely perforated and projecting outside the pillared structure through the use of pilasters. In addition, on the facade facing the entrance, a parallel system of moldings, taking higher up the levels of the landings of the side elevations, shows the outside the altimetric development of the landings and lines of the slopes of the flights of steps and, therefore, connotes the design the perspective with an original use of the sloping lines and the subsequent allusion to movement.

Specifically, the spatial configuration to “wings of seagulls” comes from the peculiar planimetric design of the staircase. This, in fact, refers to the double monumental staircase with four flights of stairs that

wrap around an empty space sharing a central flight. In this diagram, the edge of the staircase is set along the transverse direction, thus confirming the architectural layout called a double monumental staircase, and at the same time, giving the central bay on the ground floor, free and not committed to any flight (see, for example, the staircase in Weissenstein Castle in Pommersfelden by Johann Dientzenhofer, 1711-18; the Daun-Kinsky Palace, 1713 by J. L. Hildebrandt) (Fig. 2-A). This solution allows to connect the front courtyard with the free space behind to be used as a garden. At the same time, by virtue of the existence of a completely perforated body of the staircase, this solution allows the passerby to see through entrance, beyond the body of the staircase and into the garden at the rear.

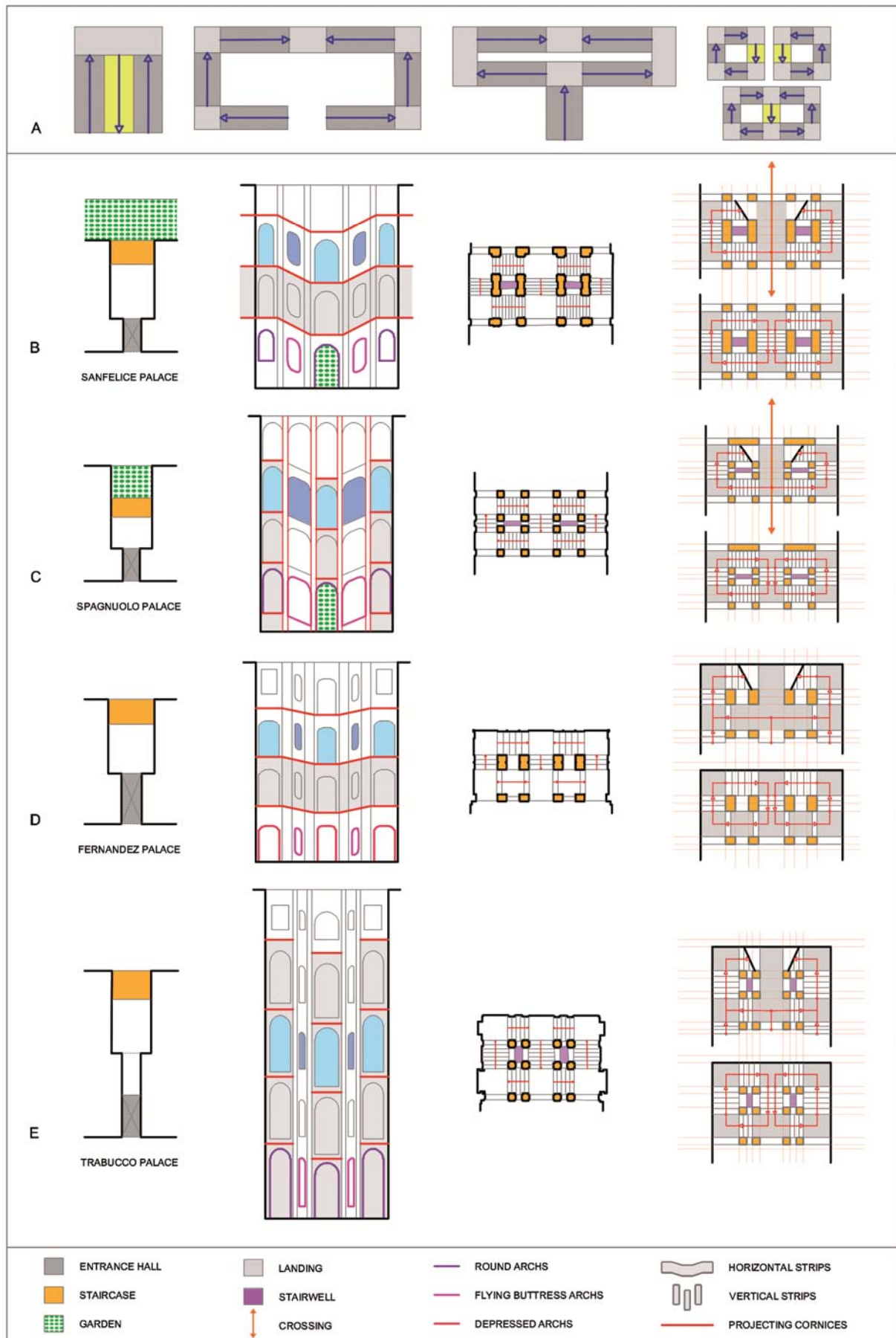
This model – with or without a garden – was widely replicated in Naples that had fallen in love with spectacular Baroque scenery, with the staircases of the Spagnuolo (Via dei Vergini, 19), Fernandez (Via San Giuseppe dei Nudi, 25) and Trabucco (Vico San Liborio, 1) being outstanding examples albeit with more or less relevant differences.

In 1738 Ferdinando Sanfelice was responsible for realising a noble residence in Via Vergini, known as Palazzo dello Spagnolo, re-proposing the “gullwing” staircase with some slight variations, which make the perspective on the courtyard even more “ethereal”. While the main supporting structure still consisted of sixteen pillars, the floor plan of the double staircase, as in Palazzo Sanfelice, and the main body of the staircase, the diaphragm between the two courtyards (one of which was to be used as a garden), the perspective onto the entrance is reduced even further since the wall system is reduced to the pillars upon which the arches and vaults rest. In addition, the wing shaped marcapiano – that gave continuity to Palazzo Sanfelice, with three horizontal, broken strips – is discontinuous, thus enhancing the verticality of the side and central spans. Finally, the last level of the perspective, instead of ending with a view of the pillars and rear loggia – presents an additional floor pierced by arches with the same line. The building also has a rich array of stuccos, subsequently realised by Aniello Prezioso based on drawings by Francesco Attanasio (Figs. 2 - C, 3 -C).

The staircases of the noble residences Fernandez and Trabucco were based on the “gullwing” model and built by students from the Sanfelician school. If compared, the fronts of the courtyard of the two staircases seem to arise at the antipodes, almost as if hybrids of the previous Sanfelician solutions. Unlike the original models, these two staircases do not have a garden behind them, with the only façade perforated being the entrance. The scenic backdrop of Palazzo Fernandez refers more to Palazzo Sanfelice since it has both a front pierced with arches (a low arch) and windows (instead of only the reduction of the pillars), as well as the molded strip that, however, has a lesser inclination since the layout of the staircase is different. In fact, in accordance to the model of the double monumental staircase, there are only three flight of steps that wrap themselves around at right angles to the corresponding wells in Palazzo Fernandez; the fourth flight (the one that touches the front of the courtyard) is absent and replaced by a few steps. Therefore, the horizontal strips that create the prospect appear less pronounced and almost horizontal (Figs. 2-D, 3-D).

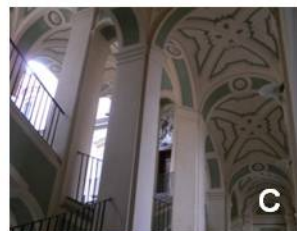
Built by Nicola Tagliacozzi Canale, the staircase of Palazzo Trabucco serves five floors (unlike the previous one which only four) and looks out onto a courtyard whose transverse dimension is much smaller than the others. This accentuates the effect of vertical thrust of the perspective that, even in this case, is enhanced by the reduction of the front wall to the sole of the pillars with arches and the absence of a continuous molded strip. Consequently, there is a dynamism in the perspective that is created by alternating the height of the vertical bands corresponding to the central and side spans, which is further accentuated by the remaining ones that, qualified by a reduced passage, leave space for the rampant openings, perceived as if slots (Figs. 2-E, 3-E).

Overall, the open Sanfelician “gullwing” staircase innovates with imagination and boldness the design of the residential staircase, making it the central place of the representative space of architecture. The objectives of Sanfelice such as the scenic and, at the same time, structural wonder give a new type of body to the staircase that make the multiple perceptions as well as contrasts of light the main elements of an original design. The reinterpretation of the double monumental staircase and its spatial reconfiguration in multiple vertical levels (made possible thanks to a daring experimentation of walls, pillars, arches and vaults) results in a new space of the journey; the perceptual experience is dynamic and full of multiple views presented by both visual continuous visual crossings that along with the “holes” of the arches and wells allows the gaze to go in all directions as well as the change of the tonal value of the light. In this architecture of visibility and multiple experiences, the prevailing feeling is one of being in an “explosive”, “centrifugal” space, where anything can and must remain immobile.



**Fig. 2:** Planimetric diagrams of double staircases; B-Palazzo Sanfelice; C-Palazzo dello Spagnuolo; D-Palazzo Fernandez; . E-Palazzo Trabucco.





**Fig. 3:** B-Palazzo Sanfelice; C-Palazzo dello Spagnuolo; D-Palazzo Fernandez; .E-Palazzo Trabucco.

### 3 . The Sanfelician “cantilevered” model: the introverted staircase

As previously mentioned, in the 1720s Ferdinando Sanfelice realised his family home in Via Arena in the Sanità, consisting of two buildings (with independent entrances) and two courtyards (separate and different shapes) overlooked by two different staircases, the “gullwing” (previously described, n. 6) and the “twin-scroll” (n. 2). It is well-known that the spatial configuration of a “spiral” staircase arises from a planimetric circular or oval shape where the steps dwindle in size towards the center or the inside, however, leaning on a central pivot (called “core” or “column”). The solution designed (and realised) by Sanfelice is “double” in the sense that there two separate staircases that run parallel but in opposite directions and are accessed by a single straight flight located in the middle (Figs. 4 -E , 5 -E). The typological reference is, therefore, the double staircase where the central ramp is lower and bisects into two right-angled sides as well as the double spiral staircase in the castle of Graz in Austria and dated 1499 where, unlike the one built by Sanfelice, the flights are initially separate and then come together in a share landing. Sanfelice’s solution was to follow the one rectilinear flight with the two spiral flights in a median position, serving two distinct and symmetrical entrances with respect to the central axis of the planimetric configuration. Overall, this staircase is full of the intense “introverted” spatiality, internal and confined. In fact, while going up the steps, it is gradually revealed, with surprise, stopping at to the small overlook, that is over the courtyard, and then leading to the first and only floor. In addition, the presence of only two light sources (the aforementioned small one and a single open window overlooking the rear perimeter wall) contribute to the gradual unfolding of the reservoir of space particularly in light of the significant tonal variation of the natural light that is appreciated during the climb.

Sanfelice designed a further two “introverted” staircases in Naples which, just as with the twin-scroll of Palazzo Sanfelice, are characterized by the analogous design of an attractive and intense internal space that is not manifested by anything outside: these are in the noble residences of Palmarice (Piazzetta Teodoro Monticelli ) and Bartolomeo di Majo (Descent Sanità, 68). The design of both of these staircases revisit the “ring” where the steps, clamped to the side walls, leave a central space known as a “well”. In this case , the steps are “cantilevered” and the staircase is statically self-supporting in the sense that it does not possess load bearing elements apart from the connection of the steps to the exterior walls. This type of staircase can also be developed on a square plan, variously polygonal, as well as circular or oval plane: in the latter, there are noteworthy examples of “cartouche” staircases by Jacopo Barozzi, known as Il Vignola, in the Palazzo Farnese in Caprarola as well as oval staircases by Andrea Palladio, including the one built in the Academy of Venice and, in 1786, Goethe said to be “the most beautiful spiral staircase in the world [so that] we do not grow weary of climbing and going down it”. Thus, the staircases of the noble residences Palmarice and Bartolomeo di Majo are cantilevered stairs which represent further remarkable examples of the unprecedented structural imagination of Ferdinando Sanfelice.

The staircase of Palazzo Palmarice can be accessed through a small Sanfelician style portal (mixtilinear molding wrapped with studs and diamond point located in the left corner of the courtyard (Fig. 2-B, 2 -B). The staircase develops planimetrically along an octagon, or a square rotated 45° and with the vertices blunted. This allows to set the flights along the directions of the diagonals as well as obtain triangular landings and a central square shaft, which is also rotated 45° with respect to the portal. This is not insignificant, when considering, in relation to the direction of the front of the perspective that “hides” the scale, that they are not parallel, but rather, create an unusual perceivable dynamism from both the entrance on the ground floor as well as the openings at the different levels and from which the staircase is illuminated. The intrados of the flights is solved with Roman vaults while the landings are covered with spindles. The spatial configuration of the staircase of Palazzo Palmarice has a basic geometric layout but the result is spectacular, not only due to the dynamism that the solution of the rotation to 45 degrees generates, but due to the contribution of the natural light that, penetrating through the arches opening onto the courtyard (including the top floor, one oval eye), is the other variable and constant component of the spatial design by Sanfelice.

In 1726 Ferdinando Sanfelice renovated Palazzo Bartolomeo di Majo, creating another unique cantilevered staircase (Figs. 4-A, 5-A). In this case, the spatial body is a rhombus with convex sides towards the inside of the well and rounded vertices. Even in this case, the four flights are arranged along the diagonal directions of the rhombus to the convex sides and, consequently, the planimetric shape of the well is to concentric with that of the reservoir wall so that, looking at it, the planimetric plane of the Palazzo Bartholomew di Majo staircase (also in this case, the flights are covered by barrel vaults and the landings with spindles) seems to be the topological stretching of the Palazzo Palmarice staircase along one of its axes. Looking at it from below, the Palazzo Bartolomeo di Majo staircase seems to stretch upward like an elastic material, almost unfolding like a ribbon and this feeling is supported by the absence of moldings on the external walls joining the arches that support the flights. Bernardo De Dominici, biographer of Sanfelice, commented on this staircase with great admiration: «It is the most capricious staircase in Naples, bringing wonder to how so a great staircase can be in the air, with only one part being connected» [1].

The description of the design of the open staircase by Ferdinando Sanfelice for Palazzo Capuano-Lauriano in Vico Pellegrino (Figs. 4-C, 5-C) is worth mentioning. Planimetrically, the staircase relates to the double staircase model, while introducing a variant. In fact, the lateral flights, from which it has access, do not have a rectilinear development but are arranged at a right angle along the adjacent sides of a square rotated 45° with respect to the courtyard, while the flight is arranged along the median axis. This allows to jut part of the staircase onto the courtyard and to model the perspective spatially. Thus, the three sides of the masonry walls, which extend towards the hallway, open up a series of arches (on the central front) as well as a series of oblong octagonal windows on the front sloping sides. As with the “gullwing” staircase, also in this case, the line of slope of the flights is declared to the outside by virtue of the presence of a molding that follows the movement of the facade and which contributes to reinforcing the dynamic effect of the design of the perspective. However, unlike the “gullwing” model, the flights ramps but not unload onto pillars but rather onto masonry walls that reduce the transparency effect of the staircase.

The open staircase of Palazzo Mastellone also seems to be inspired by Sanfelice, located in Piazza Carità and renovated in 1732 by Nicol Tagliacozzi Canale, architect of the adjacent Palazzo Trabucco (Figs. 4-D, 5 -D). The spatial layout of this staircase has several elements that connect it to the work of Sanfelice, such as the theme of the double staircase and the projection onto the courtyard, although in this case, the part that juts out into the hallway is only the flight of steps that leads to the ground floor, modelled according to a curvilinear connection. Specifically, the theme of the double staircase and the projection onto the courtyard make it similar to the double spiral staircase of Palazzo Sanfelice as well as the perspective of Palazzo Lauriano-Capuano.

#### **4. Architectural surveys as an investigative tool**

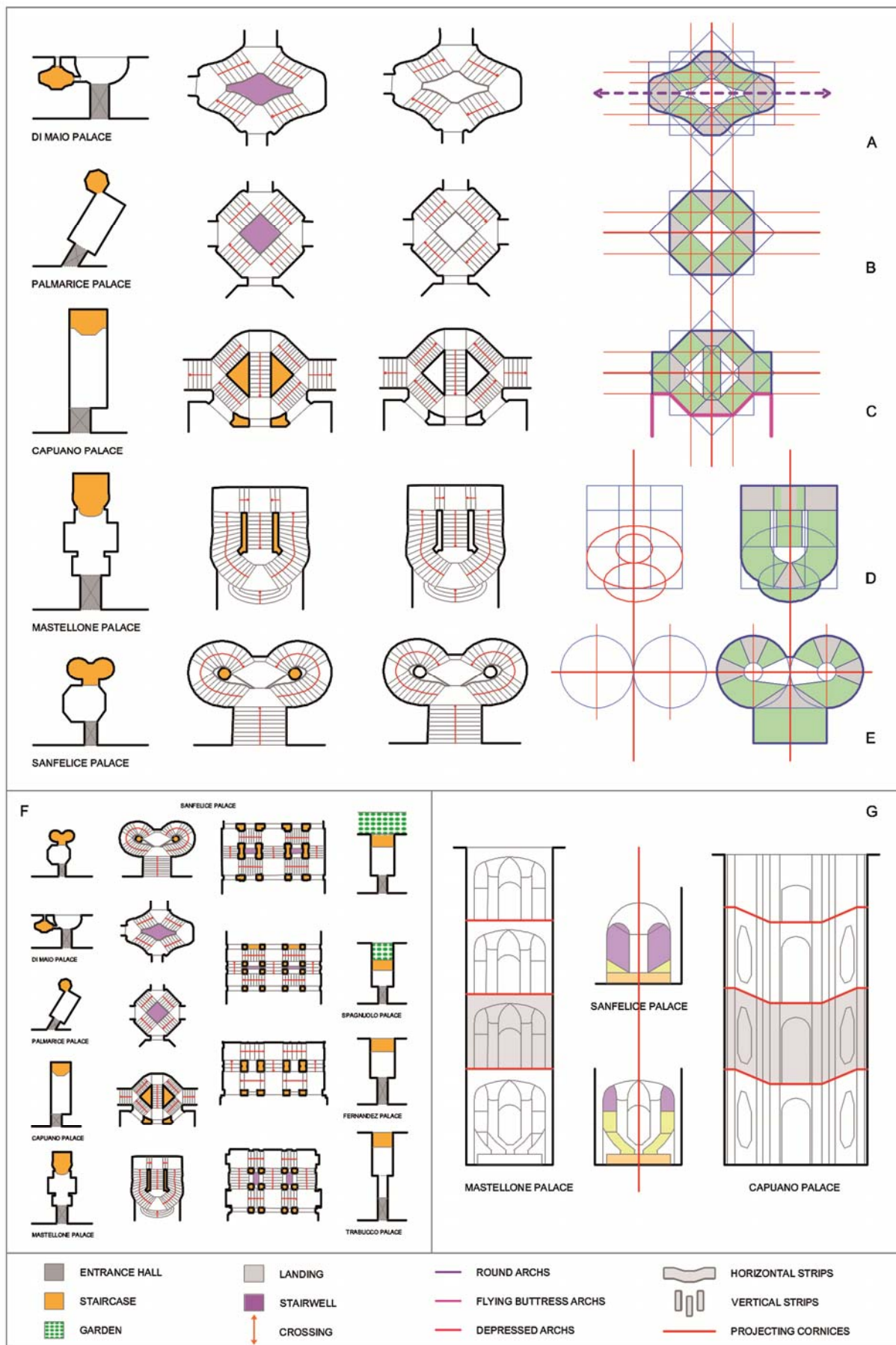
The graphical and configurational analysis of the similarities and differences of the Sanfelician staircase (and those built based on it) have been the subject of study by a research team led by the writer and includes Giuseppe Celiento, Vincenzo Cirillo, Raffaele Federico, Valeria Marzocchella and Salvatore Volpicelli. The diagrams compare – for the first time and to the same scale of representation – the staircases designed by Sanfelice in Naples and highlight the spatial qualities that have made them well-known (Figs. 2, 4). These issues have been dealt with in an architectural survey campaign of several staircases in Naples, where the spatial layout refers to the Sanfelician models discussed here, and where, specifically, the research work was supported by the recent archive studies carried out by Alfonso Gambardella, one of the most important scholars of the works of Ferdinando Sanfelice. The staircases, studied under the scientific coordination of the author, have been analysed by the entire research team as well as individually by each member of the group (Fig. 6). They are located in Via Nilo, 30 (Palazzo D’Afflitto, Vincenzo Cirillo), Salita Capodimonte, 10 (Palazzo Santoro, Raffaele Federico), Via Duomo, 220 (Palazzo Persico, Giuseppe Celiento), Via Salvatore Rosa 98 and 103 (Palazzo Maciocco, respectively Salvatore Volpicelli and Valeria Marzocchella).

The architectural survey campaign of the staircases was carried out by Pasquale Argenziano (the laser scanner survey), Antonio Grillo (3D prototypes) and Assunta D’Urzo, Gino Spera, Igor Todisco, Antonio Trimarchi (the photographic documentation).

Specifically, in the early Sixties of the last century, the staircases in Palazzo Maciocco and Palazzo D’Afflitto were surveyed by Michele Capobianco as part of a teaching laboratory and published - together with the findings of most of the Sanfelician staircases examined here – in three issues of the journal “L’architettura. Cronache e storia” [4, 554-557; 5, 694-697]. The surveys and photographs attached contribute to the data making it possible to carry out a comparison with the significant changes that subsequently occurred. The staircase of Palazzo Santoro was previously studied and then surveyed by the author in 1992 as part of the educational field survey coordinated by Rosa Penta [10, 11]. The architectural survey carried out on these five staircases - whose formal and spatial characteristics from a geometric-configurative point of view refer to the Sanfelician models analyzed here - give a new and innovative contribution due to both the type of comparative study of the similarities and differences as well as the instrumental innovation introduced during the survey campaign that allowed to exploit even more the formal and metric data. Moreover, by virtue of modern modeling vector digital systems, it was possible to see new and unusual views of the staircases, thus confirming the prominent role of representative space of the architecture of the residence.

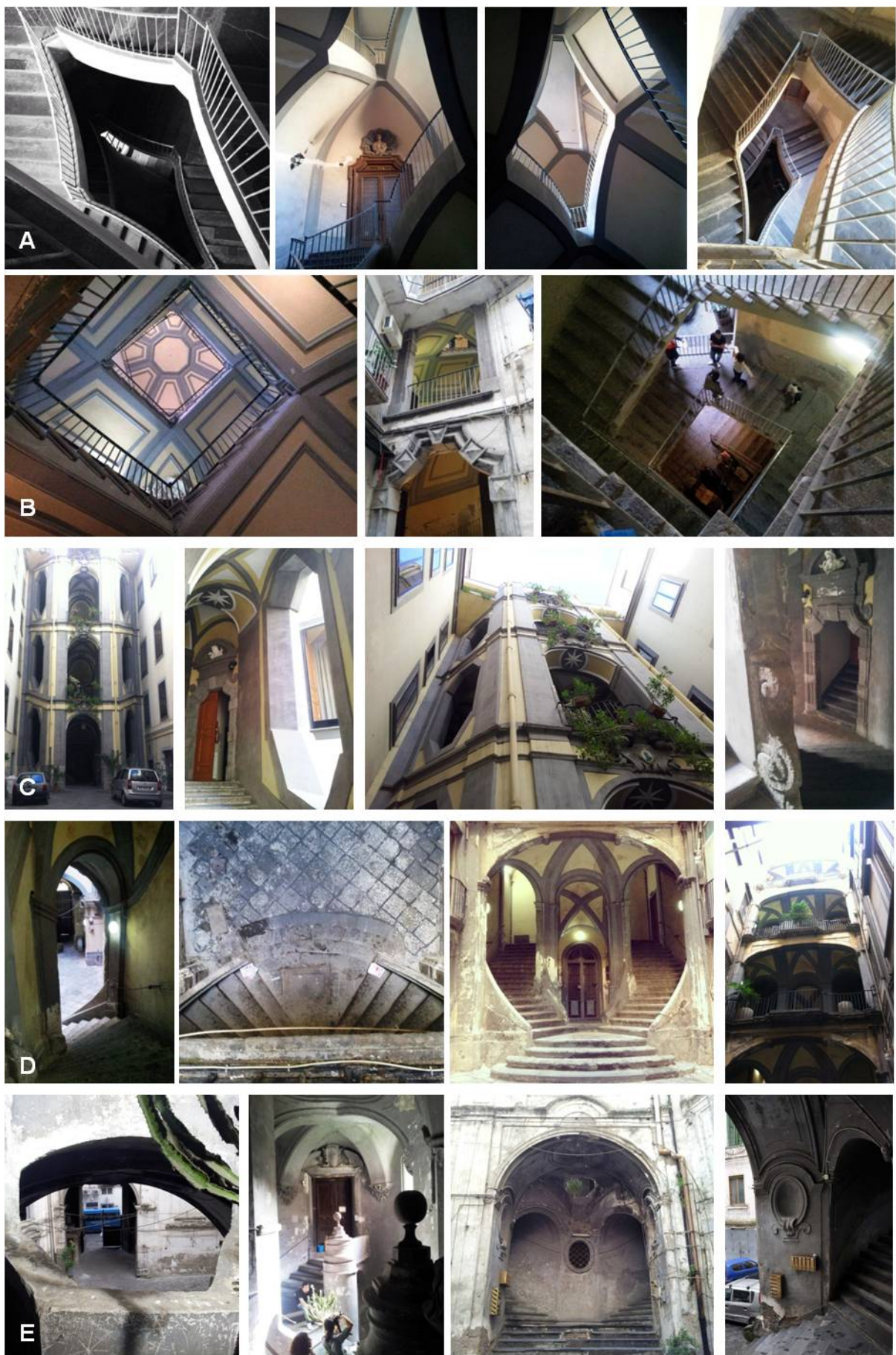
The architectural survey and analysis of the staircases is currently in press (translated by Sacha Anthony Berardo).





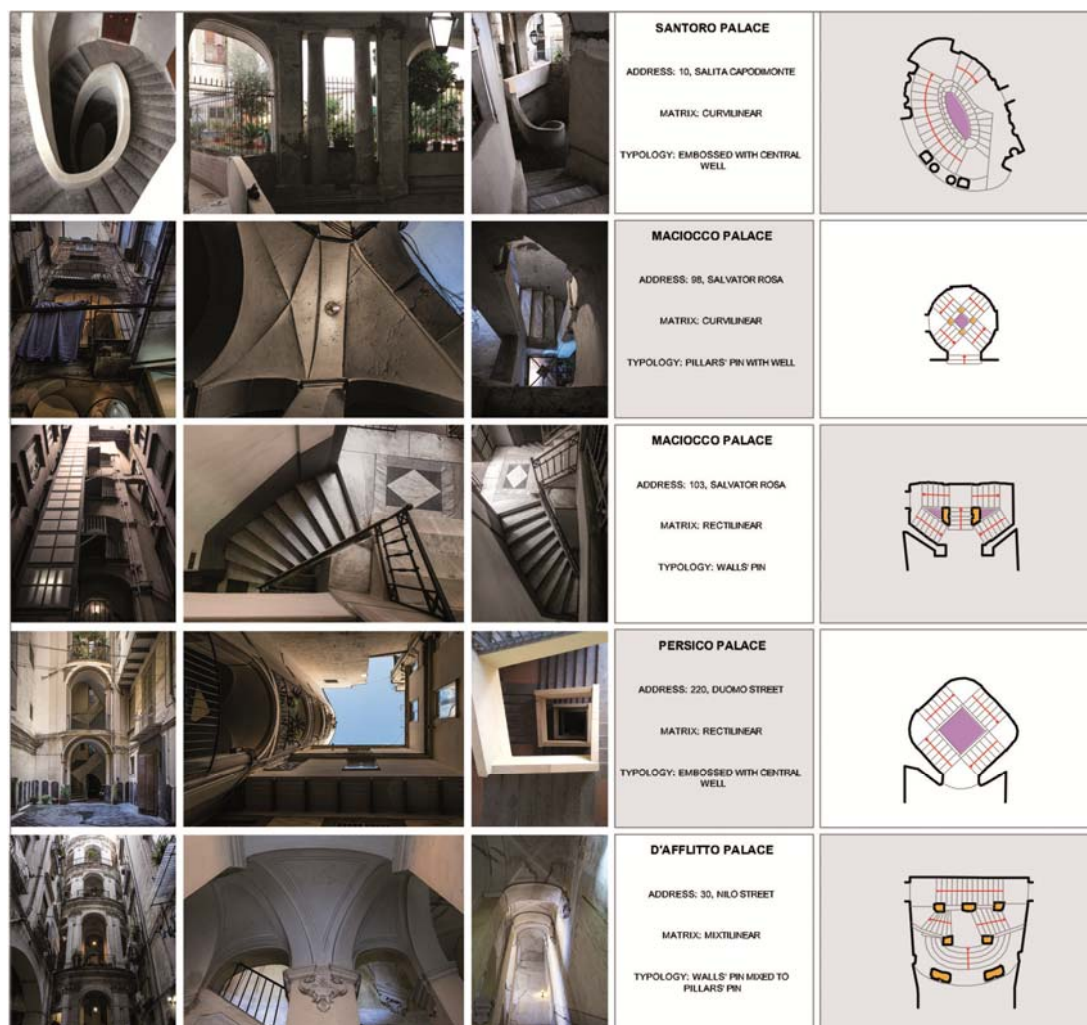
**Fig. 4:** A-Palazzo Bartolomeo di Majo; B-Palazzo Palmarice; C-Palazzo Capuano-Lauriano; D-Palazzo Mastellone; E-Palazzo Sanfelice; F-Comparative diagrams; G-Comparisons of perspectives.





**Fig. 5:** A-Palazzo Bartolomeo di Majo; B-Palazzo Palmarice; C-Palazzo Capuano-Lauriano; D-Palazzo Mastellone; E-Palazzo Sanfelice





**Fig. 6:** The staircase as a representative system of architecture (survey campaign coordinated by Ornella Zerlenga, 2013).

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